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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
LAMB, CHRISTOPHER RAY	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,660	KIMURA, TOHRU	
	Examiner	Art Unit	
	Christopher R. Lamb	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-10,12,16-19,21,22,24-31,33,37-41,43,44,46-53,55 and 59-63* is/are rejected.

7)☒ Claim(s) *3,11,13-15,20,23,32,34-36,42,45,54,56-58 and 64* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 13 is objected to because of the following informalities: “half adjust of X)" should be "half adjust of X.” Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 5-7, 10, 12, 16, 17, 21, 27, 28, 31, 33, 37, 38, 43, 47, 49, 50, 53, 55, 59, and 60 are rejected under 35 U.S.C. 102(b) as being anticipated by Kiriki et al. (US 6,349,083).

Regarding claim 1:

Kiriki discloses:

An objective lens used for an optical pickup device, wherein the optical pickup device comprises:

a light source (Fig. 19); and

a converging optical system including the objective lens for converging a light beam emitted from the light source to an information recording surface of an optical information recording medium (Fig. 19), and

the optical pickup device is capable of recording and/or reproducing information by converging the light beam emitted from the light source to the information recording surface of the optical information recording medium with the converging optical system (Fig. 19), and

wherein the objective lens is a plastic single lens (column 1, lines 35-45) and satisfies following formulas:

NA≥0.8 (shown in Table 9)

1.0>f>0.2 (shown in Table 9)

where NA is an image-side numerical aperture of the objective lens, which is required for recording and/or reproducing information to the optical information recording medium and f (mm) is a focal length of the objective lens.

Regarding claim 5:

Kiriki discloses:

wherein m satisfies a following formula when m is an image formation magnification of the objective lens: 0.2>.vertline.m.vertline.>0.02 (shown in the Table 9).

Regarding claim 6:

Kiriki discloses:

An objective lens used for an optical pickup device,

wherein the optical pickup device comprises a light source (shown in Fig. 19); and

a converging optical system including an objective lens for converging a light beam emitted from the light source to an information recording surface of an optical information recording medium (shown in Fig. 19), and

the optical pickup device is capable of recording and/or reproducing information by converging the light beam emitted from the light source to the information recording surface of the optical information recording medium with the converging optical system (shown in Fig. 19),

wherein the objective lens is a plastic single lens (column 1, lines 35-45) that comprises a ring-shaped phase structure on at least one optical surface, the ring-shaped phase structure comprising a plurality of ring surfaces and formed so that adjacent ring surfaces generate a predetermined optical path difference for incident light (shown in Fig. 18), and satisfies following formulas:

$NA \leq 0.8$ (shown in Table 9)

$1.3 > f > 0.2$ (shown in Table 9)

where NA is an image-side numerical aperture of the objective lens, which is required for recording and/or reproducing information for the optical information recording medium and f (mm) is a focal length of the objective lens.

Regarding claim 7:

Kiriki discloses:

wherein the ring-shaped phase structure is a diffraction structure having a function for diffracting predetermined incident light and the objective lens forms a converging wave front which is converged on the information recording surface owing to an effect obtained by combining a diffraction effect and a refraction effect (column 17, lines 55-68).

Regarding claim 10:

Kiriki discloses:

wherein the ring-shaped phase structure generates the predetermined optical path difference for the incident light by forming the adjacent ring surfaces so as to be displaced in an optical axis direction each other, and the objective lens forms a converging wave front which is converged on the information recording surface owing to a refraction effect (column 17, lines 55-68).

Regarding claim 12:

Kiriki discloses:

wherein a total of the ring surfaces is from 3 to 20 (apparent from Fig. 18).

Regarding claims 16, 17, 21, 27, 28, 31, 33, 37, 38, 43, 47, 49, 50, 53, 55, 59, and 60:

All elements positively recited have already been identified with respect to earlier rejections. No further elaboration is necessary.

5. Claims 1, 2, 4-7, 9, 10, 12, 16-18, 21, 22, 24-28, 30, 31, 33, 37-40, 43, 44, 46-50, 52, 53, 55, and 59-62 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito (US 2003/0021039)

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1:

Saito discloses:

An objective lens used for an optical pickup device, wherein the optical pickup device comprises:

a light source (paragraph 178: there is a "light source side" so there must be a light souce); and

a converging optical system including the objective lens for converging a light beam emitted from the light source to an information recording surface of an optical information recording medium (paragraph 177), and

the optical pickup device is capable of recording and/or reproducing information by converging the light beam emitted from the light source to the information recording surface of the optical information recording medium with the converging optical system (depicted in, e.g. Fig. 3), and

wherein the objective lens is a plastic single lens (paragraph 177) and satisfies following formulas:

NA≥0.8 (shown in the table in paragraph 181)

1.0>f>0.2 (shown in the table in paragraph 181)

where NA is an image-side numerical aperture of the objective lens, which is required for recording and/or reproducing information to the optical information recording medium and f (mm) is a focal length of the objective lens.

Regarding claim 2:

Saito discloses:

wherein in case that W(.lambda..sub.0, T.sub.0) is an RMS value of residual aberration of the objective lens when light having a wavelength of .lambda..sub.0 (nm) which is a design wavelength thereof is incident to the objective lens at an environmental temperature which is a first ambient temperature T.sub.0=25.degree. C. and W(.lambda..sub.0, T.sub.1) is an RMS value of residual aberration of the objective lens when light having the wavelength of .lambda..sub.0 (nm) which is a design wavelength thereof is incident to the objective lens at the environmental temperature which is a second ambient temperature T.sub.1=55.degree. C., .DELTA.W defined by .

DELTA.W=.vertline.W(.lambda..sub.0, T.sub.1)-W(.lambda..sub.0, T.sub.0).vertline. (3)

satisfies a following formula:

.DELTA.W<0.035 .lambda.rms (4)

(shown in the table in paragraph 181).

Regarding claim 4:

Saito discloses:

wherein the objective lens is an objective lens of a finite conjugate type for converging a diverging light beam emitted from the light source to the information recording surface of the optical information recording medium (shown in Fig. 3) and satisfies a following formula: 0.8>f>0.2 (shown in the table of paragraph 181).

Regarding claim 5:

Saito discloses:

wherein m satisfies a following formula when m is an image formation magnification of the objective lens: 0.2>.vertline.m.vertline.>0.02 (shown in the table of paragraph 181).

Regarding claim 6:

Saito discloses:

An objective lens used for an optical pickup device,

wherein the optical pickup device comprises a light source (shown in Fig. 3); and

a converging optical system including an objective lens for converging a light beam emitted from the light source to an information recording surface of an optical information recording medium (shown in Fig. 3), and

the optical pickup device is capable of recording and/or reproducing information by converging the light beam emitted from the light source to the information recording surface of the optical information recording medium with the converging optical system (shown in Fig. 3),

wherein the objective lens is a plastic single lens (paragraph 177) that comprises a ring-shaped phase structure on at least one optical surface, the ring-shaped phase

structure comprising a plurality of ring surfaces and formed so that adjacent ring surfaces generate a predetermined optical path difference for incident light (paragraphs 178-179), and satisfies following formulas:

NA≤0.8 (shown in the table of paragraph 181)

1.3>f>0.2 (shown in the table of paragraph 181)

where NA is an image-side numerical aperture of the objective lens, which is required for recording and/or reproducing information for the optical information recording medium and f (mm) is a focal length of the objective lens.

Regarding claim 7:

Saito discloses:

wherein the ring-shaped phase structure is a diffraction structure having a function for diffracting predetermined incident light and the objective lens forms a converging wave front which is converged on the information recording surface owing to an effect obtained by combining a diffraction effect and a refraction effect (paragraphs 178-179).

Regarding claim 9:

Saito discloses:

The objective lens for the optical pickup device of claim 7, wherein when an optical path difference added to a wave front transmitted through the diffraction structure is denoted by an optical path difference function .PHI..sub.b defined by

.PHI..sub.b=b.sub.2.multidot.h.sup.2+b.su-
b.4.multidot.h.sup.4+b.sub.6.multidot.h.sup.6+ . . .

(wherein b.sub.2, b.sub.4, b.sub.6 . . . are 2nd-order, 4th-order, 6th-order . . . optical path difference function coefficients, respectively),

a following formula is satisfied:

-70<(b.sub.4.multidot.h.sub.MAX.sup.4)/(f.multidot..lamb-da..sub.0.multidot.10.sup.-6.multidot.(NA.multidot.(1-M)).sup.4)<-20 (8A)

wherein .lambda..sub.0 (nm) is a design wavelength of the objective lens, h.sub.MAX is an effective diameter maximum height (mm) of the optical surface on which the diffraction structure is formed and m is an image formation magnification of the objective lens

(if you plug in the values from the table of paragraph 181 you get a number that falls within the claimed range).

Regarding claim 10:

Saito discloses:

wherein the ring-shaped phase structure generates the predetermined optical path difference for the incident light by forming the adjacent ring surfaces so as to be displaced in an optical axis direction each other, and the objective lens forms a converging wave front which is converged on the information recording surface owing to a refraction effect (paragraphs 177-179).

Regarding claim 12:

Saito discloses:

wherein a total of the ring surfaces is from 3 to 20 (4 are shown in the table of paragraph 181).

Regarding claims 16 and 17:

All elements positively recited have already been identified with respect to earlier rejections. No further elaboration is necessary.

Regarding claim 18:

Saito discloses:

wherein the objective lens satisfies a following formula:

$0.8<d/f<1.8$ (14)

where d (mm) is a lens thickness in an optical axis of the objective lens and f (mm) is the focal length (the values shown in the table of paragraph 181 meet this formula).

Regarding claims 21, 22, 24, and 25:

All elements positively recited have already been identified with respect to earlier rejections. No further elaboration is necessary.

Regarding claim 26:

Saito discloses:

wherein the objective lens and the light source are united by an actuator at least to be driven for tracking (not specifically disclosed, but inherent: this is necessary to read and/or write from an optical disc with tracks, as disclosed in e.g., paragraph 164).

Regarding claims 27, 28, 30, 31, 33, 37-40, 43, 44, 46-50, 52, 53, 55, 59-62:

All elements positively recited have already been identified with respect to earlier rejections. No further elaboration is necessary.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 8, 29, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiriki in view of Maruyama (US 2001/0008512).

Regarding claim 8:

Kiriki discloses an objective lens as discussed above.

Kiriki does not disclose:

wherein the objective lens has a spherical aberration characteristic that spherical aberration changes in an undercorrected direction when a wavelength of the incident light changes to a longer wavelength.

Maruyama discloses:

wherein the objective lens has a spherical aberration characteristic that spherical aberration changes in an undercorrected direction when a wavelength of the incident light changes to a longer wavelength (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Kiriki wherein the objective lens has a spherical aberration characteristic that spherical aberration changes in an undercorrected direction when a wavelength of the incident light changes to a longer wavelength.

The motivation would have been to form an appropriate beam spot even when the wavelength varies (Maruyama paragraph 10).

Regarding claims 29 and 51:

All elements positively recited have already been identified with respect to earlier rejections. No further elaboration is necessary.

8. Claims 19, 41, and 63 are rejected under 35 U.S.C. 103(a) as being obvious over Kiriki in view of applicant's admitted prior art.

Regarding claim 19:

Kiriki discloses an objective lens as discussed above.

Kiriki does not disclose:

wherein the design wavelength of λ0 (nm) of the objective lens satisfies a following formula:

$500 \geq \lambda 0 \geq 350$.

Applicant's admitted prior art discloses wherein the design wavelength of the objective lens is 400 nm (specification page 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Saito wherein the design wavelength of λ0 (nm) of the objective lens satisfies a following formula: $500 \geq \lambda 0 \geq 350$.

The rationale is as follows:

Applicant's admitted prior art discloses that the recording density available with this wavelength is much larger than the density with other wavelengths.

Regarding claims 41 and 63:

All elements positively recited have already been identified with respect to earlier rejections. No further elaboration is necessary.

9. Claims 8, 19, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Maruyama (US 2001/0008512).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claim 8:

Saito discloses an objective lens as discussed above.

Saito does not disclose:

wherein the objective lens has a spherical aberration characteristic that spherical aberration changes in an undercorrected direction when a wavelength of the incident light changes to a longer wavelength.

Maruyama discloses:

wherein the objective lens has a spherical aberration characteristic that spherical aberration changes in an undercorrected direction when a wavelength of the incident light changes to a longer wavelength (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Saito wherein the objective lens has a spherical aberration characteristic that spherical aberration changes in an undercorrected direction when a wavelength of the incident light changes to a longer wavelength.

The motivation would have been to form an appropriate beam spot even when the wavelength varies (Maruyama paragraph 10).

Regarding claims 29 and 51:

All elements positively recited have already been identified with respect to earlier rejections. No further elaboration is necessary.

10. Claims 19, 41, and 63 are rejected under 35 U.S.C. 103(a) as being obvious over Saito.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed

in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claim 19:

Saito discloses an objective lens as discussed above.

Saito does not disclose (in the embodiment relied upon above):

wherein the design wavelength of λ0 (nm) of the objective lens satisfies a following formula:

$500 \geq \lambda 0 \geq 350$.

Saito discloses another embodiment wherein the design wavelength of the objective lens is 405 (paragraph 175).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Saito wherein the design wavelength of λ0 (nm) of the objective lens satisfies a following formula: $500 \geq \lambda 0 \geq 350$.

The rationale is as follows:

Example 5 of Saito discloses a glass lens with this design wavelength; Example 6 (the embodiment relied upon to reject claim 1) discloses a plastic lens with a different wavelength. It would have been obvious to create a plastic lens with this design

wavelength since Saito discloses both plastic and glass can be used as an objective lens. The motivation would have been to read optical recording media designed for this wavelength with a plastic lens, which is lighter and cheaper.

Regarding claims 41 and 63:

All elements positively recited have already been identified with respect to earlier rejections. No further elaboration is necessary.

Allowable Subject Matter

11. Claims 3, 11, 13, 14, 15, 20, 23, 32, 34-36, 42, 45, 54, 56-58, and 64 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 3:

The closest prior art of record, Saito, does not disclose the relationship between focal length, wavelength, and temperature recited in the claim. This limitation in combination with the other limitations of the claim renders it allowable over the prior art of record.

Regarding claim 11:

The closest prior art of record, Saito, does not disclose the specific optical path length details for each ring surface as recited in the claim. This limitation in combination with the other limitations of the claim renders it allowable over the prior art of record.

Regarding claim 13:

The closest prior art of record, Saito, does not disclose the relationship between the step height, refractive index, and wavelength recited in the claim. This limitation in combination with the other limitations of the claim renders it allowable over the prior art of record.

Regarding claim 14:

The closest prior art of record, Saito, does not disclose the specific relationship between aberration, temperature, and wavelength broadening recited in the claim. This limitation in combination with the other limitations of the claim renders it allowable over the prior art of record.

Regarding claim 15:

It is dependent on claim 14.

Regarding claim 20:

The closest prior art of record, Saito, does not disclose the specific formula recited in the claim. This limitation in combination with the other limitations of the claim renders it allowable over the prior art of record.

Regarding claims 23, 32, 34-36, 42, 45, 54, 56-58, and 64:

These claims contain language similar to that of claims already discussed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Lamb whose telephone number is (571) 272-5264. The examiner can normally be reached on 9:00 AM to 5:30 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph H. Feild/
Supervisory Patent Examiner, Art Unit 2627

CRL 9/3/08